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CHEMICAL KILLING OF SPROUTING STUMPS 3.14 2.24

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After land has been cleared of shrub or tree growth by fire or cutting, species that have the capacity to sprout from the stump or base of the stem soon send up vigorous, dense, brushy growth which is objectionable from such standpoints as fire protection and roadside maintenance. Included among such sprouters in California are all the tree and scrub oaks, certain manzanita and ceanothus species, and such other native shrubs as chamise, Christmas berry, California coffee berry, sugar sumac, Sierra chinquapin, and birchleaf mountain-mahogany. Of these, highland live oak, including the tree (Quercus wislizenii) as well as the shrub form (var. frutescens), is one of the most vigorous and persistent sprouters and one of the most troublesome. This species is of common occurrence over wide areas in the foothills and mountains of California.

In figure 1 is shown a typical live oak a few years after cutting. Such a bush may not only usurp valuable forage land but is always a potential fire hazard because of its inflammability and fire-spreading characteristics. It cannot be killed by chopping off the branches or by burning, for after such treatment the stump sends forth new growth from the base and becomes more voluminous and more objectionable than ever.

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Figure 1. A sprouting live oak stump to be killed with sodium chlorate.

The eradication of sprouting brush is a difficult problem, and considerable study has been undertaken to find a cheaper, quicker, and more positive method than blasting or grubbing. One solution of the problem has been found in poisoning with herbicidal chemicals as hereinafter described.

Of several chemicals tested extensively as a stump poison sodium chlorate has proved most effective and reliable. It is a white, crystalline, water-soluble salt, which can be purchased from chemical supply houses for 9 to 10 cents per pound. It is used as a solution (approximately 10 percent) prepared by dissolving 1 pound of the salt in 1 gallon of water.

In poisoning a stump with sodium chlorate there are four operations, as follows:

1. Desprouting (fig. 2). All sprouts are chopped off at the crown with an axe. The purpose of desprouting is to gain access to the stump and to facilitate later operations.

2. Unearthing (fig. 3). The soil or duff immediately around the stump is removed with a shovel or mattock to a depth of 3 or 4 inches, exposing all budding tissue and any large radial roots. At the same time loose litter is removed from the top of the crown so that all live portions of the stump are clearly defined.

3. Hacking (fig. 4). All live tissue is then scarred by lightly hacking through the bark. The chips are allowed to remain in place to catch and retain the poison. It is particularly important to make a complete girdle of cuts at and below ground level where new sprouts are apt to develop. Hacking is the most important operation and should be thorough.

4. Spraying (fig. 5). The 10-percent solution of sodium chlorate is applied to the fresh cuts. This is done most easily by manipulating a stream of the liquid from the nozzle of a portable sprayer. Only enough solution need be applied to saturate the freshly cut surfaces.

In figure 6 is shown the dead stump after chlorate treatment of the sprouting stump pictured in figure 1.

A complete kill of about 95 percent of stumps treated in this way can be expected from a single application of sodium chlorate. In the surviving stumps an occasional sprout will later develop but will easily succumb to a second treatment. The success from the first application falls off sharply when the stumps exceed 25 inches in diameter because the larger stumps are more irregular and more difficult to prepare.

Figure 2. First operation: Desprouting.

Figure 3. Second operation: Unearthing.

Figure 4. Third operation: Hacking.

Figure 5. Fourth operation: Spraying 10-percent sodium chlorate solution on the fresh cuts.

Six to ten stumps of average size can usually be treated with 1 gallon of solution. The average workman can treat from four to eight stumps an hour. There is little or no seasonal difference in the resistance or susceptibility of the plants to chlorate. There seems to be little difference in specific susceptibility to chlorate among the common sprouting species, although there is a difference in the ease with which the stumps can be girdled.

A few strict precautions should be observed in the use of sodium chlorate. Although chlorates may be poisonous to animals if taken internally in moderate amounts, they are not as extremely toxic as arsenites and other chemicals that are sometimes used on stumps. They do, however, have one serious disadvantage - the tendency to promote combustion. Mixtures of chlorate with fine dry organic matter are very inflammable and may even be explosive. Necessary conditions for spontaneous ignition are apparently an intimate mixture of chlorate with organic matter that is finely comminuted, acid, and rotting. Strong sunlight and low humidity undoubtedly exert an accelerating influence on the oxidation reaction. Chlorates, therefore, should not be used in hot, dry weather and strict care should be exercised to direct the spray on the live tissue of the stump only, keeping it from dead, punky wood and duff and leaf mold.

Clothing moistened with sodium chlorate and dried is very inflammable and may be readily ignited not only by a flame but even by a friction spark. Clothing, shoes, and gloves should be kept free from chlorate, but if accidentally saturated they should be kept moist until washed.

There should be no smoking where chlorates are in storage or being handled or where they have recently been applied.

Chemical killing of sprouting stumps has been used extensively and successfully in the construction and maintenance of firebreaks and roadsides in the forests of California. The method should be of economic utility for maintaining clearings around forest-guard stations, lookout towers, public campgrounds and smoking areas, under electric power lines, and along railroad rights-of-way. Chlorate could be used to remove willows and alders from the banks of reservoirs, irrigation ditches, and flood-control channels. Householders would find the method both cheap and positive for ridding their property of unwanted eucalyptus, redwood, and other sprouting species.

Figure 6. The treated stump a year later, completely killed by the single application of sodium chlorate.

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For large-scale clearing of undesirable brush on range land the method is not cheap, but the application of chemical at the time of the original clearing, when trees are felled for wood, would be convenient and would insure valuable forage land against later encroachment of brush issuing from the old stumps. The advantage of eradicating stumps with chemicals has been repeatedly proved in forestry practice and with adequate attention to precautions the method is certain to find more general profitable employment.